

CLAIMS

We claim:

1. An image sensor, comprising:
a sensor array comprising a two-dimensional array
5 of pixel elements, said sensor array outputting digital
signals as k-bit pixel data representing an image of a
scene;
a companding circuit for companding said k-bit
pixel data into h bits, h being less than k; and
10 a data memory, in communication with said sensor
array, for storing said h-bit pixel data for each of
said pixel elements.
2. The image sensor of Claim 1, wherein said
companding circuit comprises a look-up table containing
15 values for mapping a k-bit number to a h-bit number.
3. The image sensor of Claim 1, wherein $h=k-1$.
4. The image sensor of Claim 1, wherein said
companding circuit applies a transfer function for
companding said k-bit pixel data into h bits, said transfer
20 function being a linear function at low intensity values and
a logarithm function at high intensity values.
5. The image sensor of Claim 1, wherein said transfer
function increments said k-bit pixel data in step size less
than a perceptible threshold of the human visual capability.
- 25 6. A method for generating electrical signals
representing an image in a digital image sensor, comprising:
generating digital signals as k-bit pixel data,
said pixel data being associated with each pixel
element in a sensor array of pixel elements and

corresponding to a level of an analog signal indicative of a light intensity impinging on said pixel element; companding said k-bit pixel data into h bits for a first one of said pixel elements, h being less than k; and

storing said h-bit pixel data in a location in a data memory associated with said first one of said pixel elements.

7. The method of Claim 6, wherein said act of companding comprises mapping a k-bit number to a h-bit number using a look-up table.

8. The method of Claim 6, wherein $h=k-1$.

9. The method of Claim 6, wherein said act of companding comprises applying a transfer function for companding said k-bit pixel data into h bits, said transfer function being a linear function at low intensity values and a logarithm function at high intensity values.

10. The method of Claim 6, wherein said transfer function increments said k-bit pixel data in step size less than a perceptible threshold of the human visual capability.